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ABSTRACT

The introductory discussion focuses on research which shows relationships between self-perception and school performance, and emphasizes especially a locus of control measurement scale developed to assess children's belief in internal vs. external control in academic situations exclusively. Internality is seen as constituting a motivational influence upon achievement performance. In this study, conducted with 99 4th, 5th and 6th graders, the author examined relationships between internality and performance on spelling, vocabulary and math tests in which subjects determined the levels of difficulty at which they worked. Correlation was controlled for IQ and achievement. At each grade level, internality showed a significant positive correlation with performance. For boys, this relationship was stronger than that found between performance and IQ, while for girls IQ correlated more highly with performance than did internality. (Author/TL)

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**CHILDREN'S PERCEPTION OF THEIR ACADEMIC ABILITY
AND ACHIEVEMENT ACCOUNTABILITY**

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July 1971

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SUMMARY

This study, conducted with 99 4th, 5th and 6th graders, examined relationships between internality and performance on spelling, vocabulary, and math tests in which Ss determined the levels of difficulty at which they worked. At each grade level internality showed a significant positive correlation with performance. For boys this relationship was stronger than that found between performance and I.Q.; for girls I.Q. correlated more highly with performance than did internality.

CONTENTS

SUMMARY.....	i
INTRODUCTION.....	1
METHOD.....	3
RESULTS AND DISCUSSION.....	4
REFERENCES.....	10
FIGURE 1.....	5
FIGURE 2.....	5
TABLE 1.....	6
TABLE 2.....	7
TABLE 3.....	8
TABLE 4.....	9

INTRODUCTION

Measures of self-perception have recently been found to have higher correlations with scholastic performance than do measures of aptitude (Jones and Grienecks, 1970; Binder, Jones, and Strowig, 1970). With an increased emphasis on independent study, individualized instruction, self-study aids and student options, the pupil's perception of his academic ability needs to be carefully examined (Smith, 1968). Decisions formerly made by an educator on a relatively objective basis (e.g. standardized achievement or aptitude measures) are now being made by the individual student, presumably on the basis of his assessment of himself in relation to his academic environment.

There is a need to identify variables that affect performance on self-selected tasks, and a need to demonstrate whether or not these variables are manipulative. Then we can either prepare students to work in an open-structured environment, or differentially assign them to academic settings according to their ability to function in self-directed vs other-directed situations.

A seemingly important aspect of self-concept was examined by Crandall, Katkovsky, and Crandall (1965) who developed the Intellectual Achievement Responsibility (IAR) Scale. Similar to previously developed I-E (internal vs external) scales (Rotter et al., 1962; Bialer, 1961; Battle and Rotter, 1963) the IAR was an attempt to measure the degree to which an individual feels he has control over his environment as opposed to his being controlled by outside forces. The IAR differed from the earlier scales in that it was designed to assess children's belief in internal vs external control in academic situations exclusively. As such it was intended to be a predictor of school achievement. However, contrary to expectation it showed relatively little relationship to either SES or intelligence--variables which show moderately high correlations with other I-E scales (Graves, 1961; Batter and Rotter, 1963).

Crandall and others speculated that emphasis on personal responsibility is more constant across classrooms than across households. Thus, scores on a measure of Intellectual-Achievement Responsibility would be relatively homogeneous when compared with scores on an I-E measure related to a variety of situations (e.g. political, social, moral, and intellectual). However, Crandall, Katkovsky and Preston (1962) demonstrated a high positive correlation between internality and the amount of time first, second and third grade boys chose to spend in intellectual activities during free play.

This finding coupled with the relatively low correlations between internality and I.Q. in the later study (Crandall et al., 1965) led to the speculation that internal orientation represents a motivation propensity. "It seems probable that a belief in self-

responsibility constitutes a motivational influence upon achievement performance and thus should predict behavior on tasks where motivational factors account for a relatively large proportion of the variance over and above ability or acquired knowledge. The child who feels responsible for his success and failures should show greater initiative in seeking rewards and greater persistence in the face of difficulty" (Grandall et al., 1965).

Indeed, it seems reasonable that a high internal-oriented student will use options to optimize his degree of challenge and level of success. Thus, a school-oriented I-E measure may be a better predictor of academic achievement in a free learning situation (e.g. students are given options) than in a highly structured learning environment. However, even if this is the case, one could expect a moderately high correlation between I-E and I.Q. as well as I-E and achievement. Furthermore, if the I-E instrument is to be useful, it must be refined to discriminate regardless of the homogeneity of students on this trait.

The purpose of this present study is to examine relationships between internality and achievement-related variables in a performance situation where students determine the difficulty level at which they desire to work. The Academic Achievement Accountability (AAA) Questionnaire developed for this present study resembles the IAR in its attempt to assess internal-external control as it relates to school performance. It differs from the IAR in the following ways: AAA consists of fifteen questions to which the student answers "YES" or "NO". It requires about 80% less reading than the thirty-four item IAR measure. While IAR attributes the source of external control to parents, friends, and teachers, AAA emphasizes luck, chance, and fate. There is a two-fold reason for this deemphasis of "significant others". First, it is possible that students who do not see themselves as accountable for happenings are also reluctant to attach credit or blame to any specific individual. They may simply perceive the events of the classroom as random happenings. Second, if there are "significant others" whom a student holds accountable for his academic experiences, these "significant others" may differ with circumstances and individuals. The assessment of such details complicates the measurement of the trait of major interest, internality. For, as the number of constructs measured within a single instrument increases, the reliability of the instrument can be expected to decrease, and the interpretation of a given score, and thus its relationship to other variables, becomes increasingly tenuous (Lord and Novick, 1968).

IAR attempts to distinguish between self and others as causal factors in academic achievement; AAA tends to discriminate between self accountability and no accountability. Thus, it is not so much a matter of asking a child whether he or someone else is the cause, but asking whether he is the cause as opposed to there being no definable cause for an event.

METHOD

Subjects

Ninety-nine fourth, fifth and sixth graders from a team teaching unit in Marshalltown, Iowa participated in this information-gathering study. The Ss' I.Q.'s taken from school records, yielded an overall mean of 110.9 and a standard deviation of 14.9. The proportion of boys to girls was approximately equal at each grade level.

Instruments

Spelling, vocabulary, and math instruments were prepared. Each of these three consisted of five rows of problems representing five levels of increasing difficulty ranging from primary to junior high. At each level there were five multiple-choice items. Standardized achievement tests and grade-appropriate text materials served as guides for instrument development. This three part battery was assembled as a single instrument and is referred to as a Selection Test. Each subtest, (i.e. spelling, vocabulary, math) yields three scores: a level score (L) corresponding to the number of the row selected, (the easiest was given a value of 1; the most difficult, a value of 5) an accuracy score (A) indicating the number of correct responses in the row, and a weighted performance score called the selection score (S). The latter score is simply obtained by multiplying L and A. The subscripts, "s", "v", and "m" are used to indicate "spelling", "vocabulary" and "math" respectively. In addition, a total selection score (TS) was computed for each S by adding the three selection scores obtained on the subtests.

The AAA questionnaire, subtitled "You and School" is presented below. The asterisk indicates the response which reflects belief in internal control. An AAA score is the number of these responses selected by an individual. Thus, a high score suggests that the student holds himself accountable for his academic achievement. Estimated KR-20 coefficients of .66 and .67 were obtained from pilot samples consisting of fifth and sixth grade students.

YOU AND SCHOOL

NAME: _____

- | | <u>YES</u> | <u>NO</u> |
|--|------------|-----------|
| 1. Do your marks get worse when you don't work hard? | ()* | () |
| 2. Does studying before a test seem to help you get a higher score? | ()* | () |
| 3. Are you surprised when you get a good mark? | () | ()* |
| 4. Do you think studying for tests is a waste of time? | () | ()* |
| 5. If you get a bad mark, do you feel it's your fault? | ()* | () |
| 6. Are you surprised when the teacher says you've done an assignment well? | () | ()* |

- | | | |
|---|------|------|
| 7. When a teacher gives you a low mark is it because he doesn't like you? | () | ()* |
| 8. When you really want a better mark than usual can you get it? | ()* | () |
| 9. Do you think students get low marks just because luck is against them? | () | ()* |
| 10. Do your lowest grades come when you don't study your assignment? | ()* | () |
| 11. Do your test marks seem to go up when you study? | ()* | () |
| 12. Is a high mark just a matter of "luck" for you? | () | ()* |
| 13. Do you think you deserve the marks you get? | ()* | () |
| 14. Do you usually get low marks even when you study hard? | () | ()* |
| 15. Are tests just a lot of guess work for you? | () | ()* |

Procedure

The teachers explained and administered the selection test. The instructions at the top of each page read: Here are five rows of (Spelling, Vocabulary, Math) problems. The first row is quite easy but each of the following rows gets more difficult. Find the most difficult row you think YOU CAN WORK WELL. (Directions specific for the spelling, vocabulary, or math task were inserted here). Be sure you work ONLY ONE ROW.

The teacher was asked to read the directions aloud and clarify them if necessary. No time limit was imposed on the Ss. If after beginning a subtest, a S changed his mind about his row choice he could draw a line through the problems and proceed to select another row. (This situation was encountered only once.) The You and School instrument or AAA, also administered by the teacher, was given two days later.

RESULTS AND DISCUSSION

Table 1 . presents the grade means and standard deviations on six of the major variables. In general these descriptive statistics suggest this study was conducted with better-than-average students who tend to be relatively high and homogeneous on Academic Achievement Accountability. Although the table suggests that students maximized performance on the vocabulary task, it must be remembered that the instrument was not standardized and that the scores across subtests are not necessarily comparable. On the other hand, Figures 1 and 2 which present the mean level and accuracy scores suggest that Ss did, perhaps, make better use of option on the vocabulary and math tests than on the spelling test. This assumes, however, that we want students to select a difficulty level at which they can successfully complete about 80% of a task.

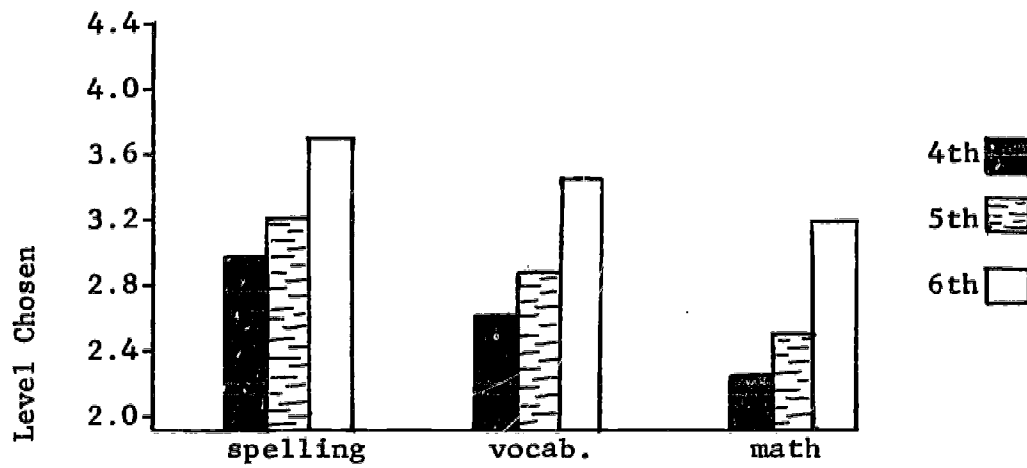


Figure 1 Mean Level by Grade

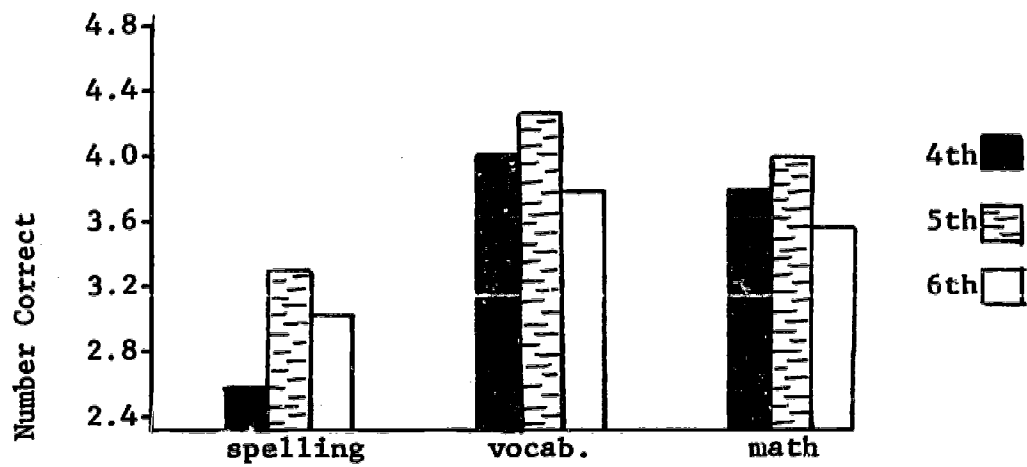


Figure 2 Mean Accuracy by Grade

TABLE 1
Means and Standard Deviations on IQ, AAA,
and Selection Scores

	IQ	AAA	S _s	S _v	S _m	TS
Grade 4 (N=26)	112.8 14.9	11.8 2.1	7.8 4.7	10.8 4.6	8.3 3.8	26.9 9.6
Grade 5 (N=34)	107.5 14.4	12.5 2.1	9.6 4.4	11.9 4.4	9.6 3.2	31.1 9.3
Grade 6 (N=39)	112.4 15.1	12.4 2.1	10.9 4.8	12.6 4.2	11.2 4.2	34.6 9.0

The top number indicates the class mean; the bottom number indicates the standard deviation.

Table 2 gives the correlations for five major variables based on the entire group of ninety-nine Ss. The correlation of .43 between AAA and IQ is high compared with .26 and .16, the correlations Crandall and others (1965) reported for IAR and IQ in the third, fourth, and fifth grades, and the sixth, eighth, tenth, and twelfth grades respectively. The relationship between sex and AAA, though not significant, is in agreement with previous findings; namely, that girls give more internal responses than do boys. Likewise in accord with former studies (Crandall et al., 1965) AAA is found to have only a slightly positive correlation with age (grade). TS which is a function of a freely selected ability level as well as accuracy of performance, shows a significant positive correlation with the other four variables. Although the .32 correlation of TS with grade might be accounted for by the fact that the selection instrument was identical for Ss across grades, the .53 correlation between TS and IQ is less obvious. These coefficients suggest that given student option, a variety of school-oriented tasks, and students ranging from grades four to six, IQ is a better predictor of performance than is age or grade. (This is undoubtedly a strong argument for nongraded structuring, provided instructional programs allow for some degree of student-selection of tasks).

The correlation of AAA with TS is rather impressive and supports the speculation that internality may be a useful predictor of academic

performance in a setting which allows for student option. AAA is, however, only a runner-up to the indestructable multipurpose variable, IQ! At least that appears to be the case.

TABLE 2
Correlations for Sex, Grade, IQ, AAA
and Total Selection Score

	SEX		GRADE	IQ	AAA
	1-M	2=F			
GRADE	.02				
IQ	.12		.01		
AAA	.14		.10	.43***	
TS	.28**		.32***	.53***	.43***

** $p < .01$

*** $p < .001$

In an exploratory study such as this in which the selection instrument has but face validity, an unestablished reliability, and an arbitrary measurement scale, precaution must indeed be taken against "over interpretation." Yet, insufficient examination of the data may be equally detrimental. From a developmental standpoint at least two additional questions seem to be in order: How do the relationships between AAA, IQ, and Selection Scores differ between grades? Are these relationships similar for both boys and girls?

Table 3 presents the correlation coefficients relevant to the first question. Two patterns emerge. First, at each grade level IQ is generally a better predictor of the selection score than is AAA. Second, the relationship of the predictor variables, especially IQ, to the criterion variable (i.e., selection scores) tends to weaken as grade rises. When one recalls that each selection score is based on only five multiple-choice items, and the total selection score on fifteen items which include three subject areas, most of the coefficients in Table 3 are moderately impressive. However, the correlations between IQ and AAA along with the correlation patterns these variables yield with the selection scores raise the devastating question: Is AAA a second-rate IQ measure?

TABLE 3
Correlations by Grade for IQ, AAA
and Selection Scores

	Grade 4 (N=26)		Grade 5 (N=34)		Grade 6 (N=39)	
	IQ	AAA	IQ	AAA	IQ	AAA
S _s	.61***	.43*	.46**	.20	.26	.26
S _v	.50**	.50**	.45**	.50**	.29	.23
S _m	.51**	-.02	.41*	.30	.33*	.30
TS	.74***	.46*	.59***	.43**	.43**	.40*
AAA	.48*		.38*		.48**	

* p < .05

** p < .01

*** p < .001

Table 4 suggests that such is not the case. For while IQ as opposed to AAA is a better predictor for girls' selection scores, just the opposite tends to be the case for boys. This supports the speculation that internality, though positively and significantly correlated with IQ, is distinct and functions as a useful adjunct predictor of academic achievement--at least for boys.

TABLE 4
Correlations by Sex for IQ, AAA
and Selection Scores

	Boys (N=51)		Girls (N=48)	
	IQ	AAA	IQ	AAA
S _s	.43**	.47***	.30*	.03
S _v	.28*	.44**	.55***	.30*
S _m	.31*	.25	.47***	.16
TS	.46***	.52***	.63***	.24
AAA	.43**		.38**	

* $p < .05$

** $p < .01$

*** $p < .001$

The noticeable difference between the correlations of AAA and performance for boys and girls might be partially accounted for by the distribution of the AAA scores for these two groups. Boys had a mean score of 12.0 and a standard deviation of 2.3, while girls had a mean of 12.6 and a standard deviation of 1.8. This suggests that girls not only score higher on internality, but are also more homogeneous than are boys with respect to this trait. At the same time, a comparison of the IQ distribution for boys and girls also reveals that the homogeneity factor is considerably more pronounced among girls. For while they have a mean IQ of 112.7 and a standard deviation of 11.5, boys show a mean of 109.2 and a standard deviation of 17.6. Yet, in spite of the homogeneity on both variables, girls show a significant correlation between IQ and AAA. Why then does AAA seem to be a more useful predictor of performance for boys than it is for girls? This is a finding which clearly supports the work of Crandall and others (1962) who likewise found that although girls (first, second, and third graders) are high on internality, their scores in comparison with boys' bear little relationship to intellectual performance.

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